

Should the Examiner however continue to insist that rejection under Double Patenting is still applicable, I formally request for the Examiner to officially verify to Applicant that the Invention claimed in this Application No 10/798,292 is already disclosed in either the Parent Patent No: 6,736,118, or in Application No: 10/798,294, officially confirming that the US Patent Office, under Examiner McMahon, has issued the Requirement for Division in error. I would then further request for the Examiner to activate the process for refund of the unnecessary Filing Fee for this Application 10/798,292, for Application 10/798,294, and for a refund of the cost for Request for Continued Examination of this Application 10/798,292.

In any event, Applicant herewith attaches the required replacement Claim Sheets, showing the Claim Amendments for the Examiner's consideration.

***Claim Rejections - 35 USC 102***

Here the Examiner has not accepted Applicant's previous arguments against such rejection posed by the Examiner. Applicant will therefore elaborate again on his citations and previous response.

Applicant first draws attention to the fact that, as is well known to anyone versed in the art, that the process of superheating cryogenic non-combustible fluids is performed for a specific purpose and to achieve specific results, and such practice and process is not to be compared with the preheating of non-cryogenic combustible fluids **in order to improve combustion efficiency and not to facilitate the actual combustion of a NON-COMBUSTIBLE fuel**, even though the heating steps for the fluids may appear to be similar.

The Examiner should first familiarise himself with the following terms and condition of "Cryogenic Fluids" as explained in Webster's Dictionary:

**MERRIAM-WEBSTER online dictionary**

**cryogenic**

2 entries found for **cryogenic**.

To select an entry, click on it.

Main Entry: **cryogenic**

Pronunciation: "krī - & - " je - nik

Function: *adjective*

**1 a** : of or relating to the production of very low temperature

**b** : being or relating to very low temperatures

**2 a** : requiring or involving the use of a cryogenic temperature

**b** : requiring cryogenic storage

**c** : suitable for storage of a cryogenic substance

**cryogenically**

adverb

/ - ni - k (& - ) 1 E /

**Production and Application of Low-Temperature Phenomena.**

The cryogenic temperature range has been defined as from -150° C (-238° F) to absolute zero (-273° C or -460° F), the temperature at which molecular motion comes as close as theoretically possible to ceasing completely. Cryogenic temperatures are usually described in the absolute or Kelvin scale, in which absolute zero is written.....

The Examiner will find that a Cryogenic Fluid, in order to be qualified as such, is at a temperature of **between minus 238 degrees Fahrenheit to minus 460 degrees Fahrenheit**, and that a reference to the superheating of such fluid usually involves an **increase of temperature from minus 460 degrees F to ambient**, where the ambient temperature, due to certain pressure conditions, may be as high as 100 degrees F, but seldom higher. The superheating of a Cryogenic Fluid is absolutely necessary to convert such NON Combustible Fluid to a Combustible Fluid and to actually facilitate the combustion process.

The Examiner should not confuse Arenson's disclosed process with Applicant's disclosed process. Applicant's process does not involve superheating becaus it::

- 1) applies only to a cryogenic fluid fuel after it has already been superheated and converted to its combustible state, should such fluid be the operating fuel in Applicant's disclosure, **which it is NOT**, or
- 2) applies to a fluid fuel which is always in a combustible state, and does not require any conversion, which is the type of fuel referred to in Applicant's disclosure.

The Arenson disclosure restricts the function of his invention solely to the conversion of a Cryogenic Fluid Fuel to is vaporous or gaseous state, and does NOT at all contemplate any combustion efficiency improvement of a fluid fuel that is already in its vaporous or gaseous state, as is specifically disclosed in Applicant's invention.

The Examiner continues to make incorrect and incomplete assumptions when citing further:

*The following is a quotation of the appropriate paragraphs of 35 USC 102 that form the basis for the rejection under this section made in this Office action:*

*A person shall be entitled to a patent unless -*

*b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.*

Claims are rejected under 35 USC 102(b) as being anticipated by US Patent No. 3,720,057 to Arenson ("Arenson").

*Arenson discloses in Figure 1 - 4 the invention described in Applicant's claims 65-69, 71, 72, 74-82, and 84. In particular, in Figure 3, Arenson shows a process and device where a first heat exchanger assembly (116) extends through a first heat transfer zone related to the combustion mechanism and a second heat exchanger assembly (126) extending through a second heat transfer zone of the combustion mechanism. The fuel supplied through conduit (120) is heated at heat exchanger (116), which is heated by exhaust gases from a combustion mechanism conveyed through line (114). Air is conveyed through conduit (128) to the second heat exchanger (126). Example 2 (beginning in column 12) shows that natural gas leave heat exchanger (116) at a temperature of 168 degrees F and that air leaves heat exchanger (126) at a temperature of 40 degrees F. These specific examples fall within Applicant's claimed temperature ranges.*

The Examiner's argument is now mute, because Applicant's Claims have been adjusted, which puts Applicant's temperature ranges completely out of Arenson's claimed operating parameters.

*In regards to claims 55 and 68, in order for the combustion device (gas turbine engine 112) of Arenson to operate, there is necessarily some means for converting the oxidation mixture of fuel and air into high temperature, high velocity combustion products.*

The Examiner is again incorrect when citing Applicant's Claims 55 and 68, for the following reasons.

Claim 55 is dependent on Claim 54 and must therefore be read together:

**54. (New Claim) A device** for reducing fuel density while increasing combustion air density, without effecting their specified volumes, thereby significantly changing the ratio of fuel mass versus combustion air mass, hence oxygen mass, during the process of ignition and combustion of fluid hydrocarbon fuels in combustion mechanisms having a combustion area and at least one burner therein for converting said fuel into heat, thrust, torque or other energy comprising:

- a) a fuel supply conduit defining a first heat exchanger assembly located in a heating zone related to the combustion area of the mechanism, providing the means to maintain a constant supply of fluid hydrocarbon fuel to the combustion area of said mechanism at a preselected optimal operating temperature level ranging between 165 degrees Fahrenheit and the fuel's flash point or auto ignition level;

b) a combustion air supply conduit defining a second heat exchanger assembly located in a cooling zone related to the combustion mechanism, providing the means to maintain a constant volume of combustion air to the combustion area of said mechanism at a preselected optimal operating temperature level ranging between ambient and minus 40 degrees Fahrenheit.

**55. (New Claim)** A device according to Claim 54, wherein at least one heat transfer zone is related to the exhaust gas vent area of the combustion mechanism.

The device referred to in Applicant's Claim 55 may operate as a heat exchanger similar to the one disclosed by Arenson, but performs a completely different function. In Arenson's disclosure IT PERFORMS SOLELY TO CONVERT A CRYOGENIC FLUID FUEL TO ITS VAPOREOUS OR GASEOUS STATE, which is not at all the process disclosed by Applicant.

Claim 68, is dependent on Claim 64, and must therefore be read together:

**64. (New Claim)** A **method** for reducing fuel density while increasing combustion air density, without effecting their specified volume, thereby significantly changing the ratio of fuel mass versus combustion air mass, hence oxygen mass, during the process of ignition and combustion of fluid hydrocarbon fuels in combustion mechanisms having a combustion area and at least one burner therein for converting said fuel into heat, thrust, torque or other energy, comprising:

- a) providing fluid hydrocarbon fuel as fuel for said combustion mechanism;
- b) directing said fuel through the fuel supply conduit defining a first heat exchanger assembly that extends through a first heat transfer zone related to the combustion mechanism;

- c) reducing the density of said fuel by heating the fuel as it flows through said first heat exchanger assembly to an optimal fuel operating temperature level ranging between 165 degrees Fahrenheit and the fuel's flash point or auto ignition level;
- d) maintaining a constant volume of density reduced fuel to the combustion area of said combustion mechanism;
- e) providing combustion air for the combustion process in said combustion mechanism;
- f) directing said combustion air through an air supply conduit defining a second heat exchanger assembly that extends through a second heat transfer zone;
- g) increasing the density of said combustion air by cooling the combustion air as it flows through said second heat exchanger assembly to an optimal air operating temperature level of between ambient and minus 40 degrees Fahrenheit;

maintaining a constant volume of density increased combustion air to the combustion area of said combustion mechanism.

**68. (New Claim)** A method according to Claim 64, wherein said preselected optimal fuel operating temperature range is within the preselected general fuel operating temperature range from 165 degrees to 900 degrees Fahrenheit.

The method referred to in Applicant's Claim 68 may operate as a heat exchanger similar to the one disclosed by Arenson, but performs a completely different function. In Arenson's disclosure IT PERFORMS SOLELY TO CONVERT A CRYOGENIC FLUID FUEL TO ITS VAPOREOUS OR GASEOUS STATE in order to facilitate combustion, without providing the means for a specific combustion efficiency increase of an already combustible fuel, which is of course contrary to the process disclosed by Applicant.

Therefore, when the Examiner continues stating that:

*Further, as shown in Figure 1, the exhaust products are used to heat a first heat exchanger (32) and additional heat exchanger (46), which is considered to be a related energy transfer system.*

it becomes obvious that the Examiner compares the heat exchanger devices disclosed in Arenson, and employed for the purpose of converting a cryogenic fuel to its gaseous state, with the heat exchanger devices disclosed by Applicant, which devices are employed for the purpose of improving the combustion efficiency of an already combustible fuel. The purpose for the use of the heat exchanger devices disclosed by Arenson is not at all the same purpose of use as disclosed by Applicant.

In fact, should the Examiner insist that the Arenson or Velke heat exchanger devices and methods still provide an objection, Applicant officially requests that the Examiner forthwith initiate the Reexamination of the following US Patents:

5,357,746	Westinghouse	System for recovering waste heat.
5,809,980	FES Innovation	heat exchanger and fuel preheater.
5,845,481	Westinghouse	Turbine with fuel heating system.
6,041,588	Siemens	Gas and steam turbine system.
6,202,402	ABB	Gas turbine construction.
6,253,554	Toshiba	Gas turbine plant with fuel heating and. turbine cooling features.

All the above disclosed heat exchanger assemblies and operations are identical to Applicant's, and if the objection cited by the Examiner fits Applicant's invention, it will most certainly fit the inventions disclosed in the issued Patents listed above.

For instance, the **Abstract** for US Patent 5,845,481 reads as follows:

*The combustion turbine system comprises a fuel line connected to the combustor with a portion of the fuel line being disposed in heat transfer relationship with the exhaust gas from the combustion turbine so that the fuel may be heated by the exhaust gas prior to being introduced into the combustor. The system may also comprise a fuel by-pass control system for mixing unheated fuel with the heated fuel to control the temperature of the fuel being introduced into the combustor.*

The **Summary** of the 5,845,481 Invention further discloses following:

*The combustion turbine system comprises a fuel line connected to the combustor with a portion of the fuel line being disposed in heat transfer relationship with the exhaust gas from the combustion turbine so that the fuel may be heated by the exhaust gas prior to being introduced into the combustor.*

In Patent 6,041,588, the **Abstract** includes the following:

*When gas is used as the fuel for the gas turbine, the partial flow is used for fuel preheating. A heat exchanger for the selective preheating either of the gas-turbine fuel or of the condensate with the partial flow is provided.*

Patent 6,253,544 is entitled "**Gas turbine plant with fuel heating and turbine cooling features**" and includes the following disclosure in the **Abstract**:  
"a gas turbine combustor arranged between the air compressor and the gas turbine, a fuel system disposed for supplying a fuel to the gas turbine combustor, and a heat exchange section for heating the fuel".

Should the Examiner continue citing these objections without initiating the Reexaminations as requested by Applicant, the Examiner could be deemed to condone, or even conceal obvious mistakes made by the US Patent Office, and by a large number of Examiners, based on his present conclusion of ***Double Patenting*** and ***Claim Rejections - 35 USC 102***, and especially ***103*** :

Examiner L. J. Casaregola,

Examiner M. McMahon

Examiner T. S. Thorpe

Examiner D. J. Torrente

However, and for further clarification of Examiner's error when citing such objection, the Arenson disclosed method and device is for the sole purpose of converting a non-combustible cryogenic liquid fuel to a vaporous or gaseous fuel such as to become combustible, and is only then treatable in accordance with Applicant's disclosed method. As stated before, a cryogenic fluid, in order to be classified as cryogenic, must be at a temperature between minus 238 degrees Fahrenheit and minus 460 degrees Fahrenheit. Therefore, as the illustrations of the Arenson Invention readily shows, all energy produced by turbine 28 is used to vaporise the cryogenic fluid, and for operating the various pumping and fluid transport means of the vaporising mechanism. Therefore, the Arenson Invention discloses a method to convert a non-combustible fluid to a combustible fluid, whereas Applicant's Invention discloses the efficiency improvement of a combustor using a combustible fluid. the Examiner should be aware of the fact that a cryogenic fluid is a NON-VOLOITILE, NON COMBUSTIBLE fluid, and is therefore not a **combustible fluid hydrocarbon fuel** as is referenced in Applicnat's invention.

Examiner will further notice that the liquid cryogenic fluid from storage container 12, which, during storage, must be constantly maintained at a suitable temperature of up to minus 460 degrees Fahrenheit, is transported past the turbine mechanism for conversion, while only a portion of such converted fuel is provided to generate both rotational energy for transporting the fluid through the heat exchangers and to provide heat required to convert the cryogenic liquid into a vaporous fluid, while the excess of converted cryogenic fluid is directed to other combustors, which may not even be turbines.

The Examiner will also notice that in all Arenson illustrations the method disclosed provides a provision for the flow-through and final outlet of the treated and vaporised cryogenic fluid. This clearly confirms that the turbine is used only as a mechanism to convert a cryogenic fuel from a liquid to a vapour, and therefore, a person of ordinary skill in the art would never perceive or anticipate the method disclosed in Applicant's disclosure to be based on Arenson.

The intermittent cooling of the inlet air claimed by Arenson is used strictly for the purpose of cooling the turbine rotors, which would otherwise superheat, as the turbine exhaust is used to provide heat, and would thereby interfere with the performance of the rotary action and heat exhaustion of the turbine.

Applicant's arguments again undoubtedly prove that the Examiner is in error when citing the Arenson Patent as basis for a Claim Rejection under 35 USC paragraph 102.

Therefore, when citing the Arenson invention as an objection to this Application, the Examiner is incorrectly comparing Applicant's invention, which, as already defined by the Director of the US Patent Office is a distinct and independent invention under classification 431 (according to Distinct Invention I, various types of heaters class 431), with an invention under classification 60 (according to Distinct Invention III, a gas turbine engine class 60) . Therefore citing such objection for this application must be considered inappropriate.

The difference and uniqueness of Applicant's Invention and the results anticipated and achieved over Arensen and Velke are obvious when the difference in both the description and the Claims are properly reviewed and compared. Should the Examiner however insist on the cited objection, Applicant would appreciate the Examiner's full and detailed reasoning relative to the new arguments.

***Claim Rejection - 35 USC paragraph 103***

The Examiner cites the following when quoting 35 USC 103 (a) which forms the basis for all obviousness rejections set forth in this Office action:

*a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.*

The above cited section 103 (a) in fact outlines precisely why the Examiner is incorrect when presenting his obviousness rejection thereunder, because this section specifically states very clearly that "*.... the subject matter sought to be patented and the prior art are such that THE SUBJECT MATTER AS A WHOLE would have been obvious....*", which the Examiner has completely failed to recognise.

When the Examiner cites:...."*Claims 65, 67, 68, 70, 75, 77, and 78 are rejected under 35 USC 103(a) as being unpatentable over Arenson as applied to the claims above and further view of US Patent No. 5,888,060 to Velke ("Velke"), US Patent No. 3,224,194 to De Feo, and US Patent No. 2,986,456 to Toulmin*" the Examiner is listing only some of Applicant's dependent Claims, which do not disclose or describe even a meaningful portion invention. All the above cited Claims are dependent Claims, and as such are meaningless without inclusion of the wording and the description of the independent portion of the Claim to which they relate and on which they depend.

In fact, when using rejected Claim 70 as an example, said Claim already reads "*A method according to Claim 65, wherein the combustion mechanism is part of a combustion turbine*" which, when used for the purpose of comparing against prior art should be viewed in its entirety, or as "*THE SUBJECT MATTER AS A WHOLE*", whereby Claim 70 would properly read as follows:

**70. A method for reducing fuel density while increasing combustion air density, without effecting specified fuel or air volumes, thereby significantly changing the ratio of fuel mass versus combustion air mass, hence oxygen mass, during the process of ignition and combustion of fluid hydrocarbon fuels in combustion**

*mechanisms having a combustion area and at least one burner therein for converting said fuel into heat, thrust, torque or other energy, comprising:*

- a) providing a constant volume of fluid hydrocarbon fuel as fuel for said combustion mechanism;*
- b) directing said constant volume of fuel through a primary fuel supply conduit defining a heat exchanger assembly that extends through a heating zone related to the combustion or exhaust vent area of the combustion mechanism, having a fuel inlet and a fuel outlet;*
- d) reducing the density of said fuel by reducing fuel mass in said constant volume of fuel through heating the fuel to an optimal operating temperature level ranging between 100 degrees Fahrenheit and the fuel's flash point or auto-ignition temperature level as it flows through said heat exchange assembly;*
- h) maintaining a constant volume of density reduced fuel for ignition in the combustion area of said combustion mechanism;*
- i) providing a constant volume of combustion air for the combustion process in said combustion mechanism;*
- j) directing said constant volume of combustion air through a primary air supply conduit defining a heat exchanger assembly that extends through a cooling zone having an air inlet and an air outlet;*
- k) increasing air density of said constant volume of combustion air through cooling said combustion air to an optimal operating temperature of between ambient temperature or plus 50 degrees and minus 40 degrees Fahrenheit as it flows through said air heat exchanger assembly;*

- l) maintaining a constant volume of cooled high density air for combustion in the combustion area of said combustion mechanism; wherein the combustion mechanism converts the oxidation mixture of fuel and air into high temperature, high velocity combustion products to operate a single or dual cycle trubine system.*

Based on the above demonstration and argument, the Examiner is making incomplete and faulty comparisons with the prior art cited, the Arenson, the Velke, the De Feo as well as the Toulmin disclosures. Just because said disclosures teach the use of one of the many 10/798,294 components as one of the operating steps of their invention does not preclude that the inventions are similar. In fact they are not similar at all.

The Examiner should have recognised again that the Arenson invention discloses the use of heat for converting a cryogenic liquid fluid from its ambient temperature of between minus 260 degrees Fahrenheit and minus 460 degrees Fahrenheit to a vaporised fluid or gas at a temperature anywhere between 6 degrees to a maximum of 168 degrees Fahrenheit. Furthermore, the Examiner should have noticed that Arenson does in fact not claim any pre-ignition fuel operating temperature range in any of his Claims.

Applicant's invention now instead discloses the use of a fluid hydrocarbon fuel already at a temperature range of between 225 degrees and some 1400 degrees Fahrenheit, or the fuel's autoignition temperature. Furthermore, Applicant discloses an invention which combines the heating of said combustible fuel with the cooling

of combustion air, a combination specifically for the purpose of increasing the oxygen volume percentage in the combustion process. Therefore it is not at all obvious that:

*"the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains",*

and as such is actually contrary to the provision in and the intent of 35 USC section 103(a) for the Examiner to pose a rejection thereunder.

The Examiner further cites the following:

*Velke teaches a device for pre-heating fluid flue to decrease its density and thus increase efficiency that is considered analogous prior art. In Velke, a heat storage material forms part of a heat exchanger assembly (see col.4, lines 18 - 23) for the purpose of equalising heat transfer from the heating zone to the heat exchanger during on/off cycles of the appliance. Velke also teaches the use of insulating material (21) in the heat exchanger shown in Figure 4 for the purpose of protecting against external heat loss. Velke also teaches that the heat transfer zone is operated from a source other than the combustion or exhaust gas vent area of the combustion mechanism in the case where access to such heat source location is difficult (see col.4, lines 16 -18). Velke further teaches the use of a heat transfer zone being related to the combustion area of the combustion mechanism for the purpose of increasing efficiency of the appliance (see the abstract). The fuel employed is natural gas, propane gas, or other conventional fluid hydrocarbon fuel (see col. 3, lines 64 - 65). In regard to claims 34 and 35, the combustion device*

*disclosed by Velke is a combustion appliance that may be a furnace or heating devices (see col.4, lines 45 - 46 and col.8, lines 45 - 51).*

When citing the Velke Patent 5,888,060, the Examiner repeats the mistake made with the Arenson comparison. The Examiner is again using dependent Claims in his comparison without referencing and including the basic invention which is specifically disclosed in the independent Claims, which are then narrowed by the dependent Claims. The large temperature range between fuel and air as claimed by Applicant to improve the oxygen ratio, a range as high as 1400 degrees Fahrenheit, would exclude any reason for comparison to establish obviousness.

Furthermore, as is described in 5,888,060 in column 5 lines 31 to 67, the expected result on which the invention is based is the increase in fuel volume ONLY, without claiming an increase in the oxygen ratio. In column 3 lines 9 to Velke discloses that fuel volume may be increased or expanded by some 15% when preheating the fuel to 115 degrees Fahrenheit.

In fact, as anyone familiar in the art understands, a certain advantage may be obtained in the process of combustion when the fuel volume flow, better explained as fuel flow speed, can be increased, an improvement in the combustion process can be obtained. This more specifically describes the invention disclosed in the 5,888,060 Patent.

In the present invention, Applicant distinctly claims an increase of the oxygen ratio in the maintained as specified combustion oxidation mixture volume.

In other words, Velke, in US Patent 5,888,060, instead claims a method resulting in a reduction of fuel consumption by way of increasing fuel volume, or (decreasing fuel density), claiming the advantage of increasing fuel volume to be the invention, but the invention does not contemplate, disclose or even claim any increase in the oxygen ratio in the fuel / air mix (the oxidation mixture) while maintaining specified volumes, nor does the 060 disclosure make any reference to the method of using the combination of heating of fuel and cooling of combustion air for the purpose of improving said oxygen ratio, even though, as the Examiner states, some of the intermediate operating stages disclosed in some of the dependent Claims of both inventions may be similar. Any such similarity of some of the operating components does NOT conclude the basis of both inventions to be identical. In fact, the disclosed methods are in stark contrast.

Although the prior art cited is not relied upon, Applicant nevertheless provided the above response to demonstrate and prove the Examiner's further obvious error.

It must also be noted that, when referencing Patent 5,888,060, the Examiner is not able to cite any Claims of said disclosure in order to substantiate relevancy as to obviousness. All citations are in reference to the description of the invention, but then only to segments and components which are claimed in dependent Claims. Such dependent Claims however do not describe the operating method or device of the invention, but describe instead only certain limitations to the independent Claims. However, should Examiner's interpretation be correct, his conclusion will also apply to the various issued Patents listed on Page 22 of this response.

This includes the use of a heat storage material, the possible employment of a heating zone other than from the combustion mechanism, or a heating zone operated by the combustion mechanism. It further includes reference to a combustion mechanism possibly being a furnace or heating device. These are all references which do not provide any indication of obviousness to a person of ordinary skill in the art at the time the invention was made, including the Arenson disclosure which provides no plausible reason for the obviousness rejection.

The Examiner is of course mistaken when suggesting such examples, and Applicant will again provide the necessary expert opinion by someone very skilled in the art, that such conclusion is contrary to expectations in the industry, even when supportive details, and in fact test results, were supplied.

Applicant again provides the Examiner with a copy of an opinion letter by CGRI the Canadian Gas Research Institute:

In a letter addressed to Applicant, dated April 27, 1999, CGRI Research Engineer Martin Thomas provided an opinion on behalf of the Canadian Gas Research Institute, stating that:

*"Oxygen enrichment of the combustion air (i.e. increasing the oxygen concentration in a volume of combustion air) is a well established industrial process improvement technique. In our opinion, the "Velke Invention of" preheating a fuel gas does not provide oxygen enrichment. To our knowledge, oxygen enrichment can only be achieved by adding oxygen to air, or by removing the other constituents (nitrogen, CO<sub>2</sub>, argon, etc.) from the air. Therefore, we cannot support the claims made in*

*the "Velke Disclosure" as a result of improvements caused by oxygen enrichment."*

CGRI the Canadian Gas Research Institute, a well recognised authority in the gas industry, thereby confirms industry opinion that the any enrichment or increase in the oxygen ratio of a given volume of combustion air can only be achieved by adding actual oxygen, or by removing the other constituents, but cannot be achieved by any other means, such as preheating of fuel or precooling of combustion air.

CGRI concludes its letter of opinion by stating that "*Because CGRI is unable to explain, through sound scientific principles, the claimed / measured benefits,....CGRI will no longer be involved in the evaluation process.*"

Applicant's invention is therewith definitely confirmed again as being unique. Therefore, the method in 5,888,060, even in conjunction with the details disclosed by Arenson, would not lead any person skilled in the art to the conclusion the Examiner was able to reach. Applicant again believes to have sufficiently demonstrated and proven that the Examiner has made a mistake in his rejection.

Applicant will attach a copy of a confidential report by the ETV Environmental Technology Verification institution, dated as late as June 2000, which institution operates under the Ministry of the Environment, Government of Canada, and further confirms that CGRI Canadian Gas Research Institute admits but to a combustion efficiency improvement of the invention which is relative only to the amount of energy added to the fuel by way of preheating, rather than to any

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other possible effect. In fact, CGRI considered any other claimed effect as a claim which is considered breaking the law of thermodynamics.

In fact, to this day, the industry only recognizes and agrees with the increase in energy input achieved due to the energy amount and increase resulted from the amount of energy added through pre-heating the fuel, but it has never recognized or agreed to any increase in the kinetic improvement or combustion efficiency improvement due to an increase in the oxygen ratio of the combustion process, and related to fuel pre-heating.

With regards to the Examiner citing Toulmin US Patent No: 2,986,456, the Examiner is in fact now agreeing with Applicant as to his referred to "Liquid Hydrocarbon Fuel Containing Powdered Coal" being a fluid hydrocarbon fuel as claimed by Applicant in the present Application.

As for the Examiner further citing Toulmin and De Feo as reason for rejection of Claims 65, 70 and 75 in view of Arenson, the Examiner forms his own argument against such citation when stating that Arenson does not disclose a liquid hydrocarbon fuel consisting of suspended coal dust or a coal dust slurry, but only refers to the conversion of a cryogenic fluid from its cryogenic state to its non-cryogenic state, and wherein Toulmin does not disclose the preheating of his fluid coal dust mixture, nor the precooling of the combustion air in his combustion process, and none of the claims by Arenson and Toulmin are for the purpose of increasing combustion efficiency in a combustion turbine system by way of

reducing fuel density while increasing combustion air density. De Feo provides compressed cool air, which, as anyone versed in the art would know, significantly elevated the air temperature, and in addition, De Feo does not even disclose any temperature range, suitable for the cooling of the turbine blades. De Feo does not disclose any precooling of air to improve the efficiency of the actual combustion process.

The Examiner should refer again to the previous pages of this response wherein Applicant already provided the following argument:

The above cited section 103 (a) in fact outlines precisely why the Examiner is incorrect when presenting his obviousness rejection thereunder, because section 103a of 35 USC specifically states very clearly that "*.... the subject matter sought to be patented and the prior art are such that THE SUBJECT MATTER AS A WHOLE would have been obvious.....*", which the Examiner has completely failed to recognize.

Using Examiner's inappropriate method for finding objections, Applicant would be able to find the same fault with most of the Patents issued by the USPTO to date.

#### ***Examiner's Response to Applicant's Arguments***

Applicant appreciates Examiner's consideration of the arguments presented by him. Applicant will try again to show why Examiner's opinion is flawed.

**Regarding Prior Art**

Examiner argues that when Applicant insists that the Arenson method, even when viewed in conjunction with the Velke Patent 5,888,060, does not CLAIM an Invention as recited in Applicant's Claims, is an inappropriate reference, and that Arenson not claiming the same Invention as Applicant is in fact irrelevant when using it as an objection.

The Examiner goes further in stating that, in accordance with the statutory language for 35 USC 102 and 103, which requires any reference to the Patent as a whole and not merely what is claimed.

In fact, Examiner is thereby contradicting his own argument. Because, if the Invention, in this case the Arenson Invention, is not described in the title of the Patent, which reads:

**METHOD OF CONTINUOUSLY VAPORIZING AND  
SUPERHEATING LIQUIFIED CRYOGENIC FLUID**

and the Abstract, which is to describe the essence of the Invention, which in this case reads:

**ABSTRACT**

The present invention relates to a method to continuously vaporising and superheating liquefied cryogenic fluid for an ultimate use. A stream of liquefied cryogenic fluid is passed in heat exchange relationship with a stream of ambient water so that the cryogenic fluid is heated and vaporised. The

vaporised cryogenic fluid stream is divided into first and second portions and the first portion is passed in heat exchange relationship with the input combustion air to a gas turbine engine so that the air is cooled and the power output of the turbine is increased. The second portion is passed in heat exchange relationship with the exhaust gases generated by the gas turbine engine so that the second portion is superheated to a predetermined temperature level, and the first and second portions of the vaporised cryogenic fluid stream are then combined so that a stream of vaporised cryogenic fluid superheated to a desired temperature level is produced. The power output of the gas turbine is advantageously used for providing power for pumping the stream of liquefied cryogenic fluid and ambient water.

It is obvious that the function of the Invention as described in the TITLE, as described in the ABSTRACT, and as described in the CLAIMS of the Patent, discloses exactly the following:

**A METHOD OF CONTINUOSLY VAPORIZING AND  
SUPERHEATING A LIQUIFIED CRYOGENIC FLUID**

and as such does not in any way claim, describe in the disclosure, anticipate or even hint the Invention disclosed in Applicant's application. In fact, using the Arenson Invention as an objection, it must be emphasized again that the Arenson method, specifically the heating means and mechanical pumping means, is specifically for converting a liquid cryogenic non-combustible fuel into a vaporous or gaseous combustible fuel, without regard for the efficiency level of such fuel during its subsequent combustion. There is absolutely NO comparison to be made between the Invention disclosed by Applicant and that of Arenson's, De Feo's or Toulmin's

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The Examiner also states that a Double Patenting Rejection is still appropriate in accordance with 35 USC 101. Applicant is of course of the opinion to have successfully argued against such citation earlier in this response. Applicant however may include pertinent third party documentation under suitable Declaration or Affidavit in accordance with 37 CFR 1.132, as the Examiner has suggested.

The amended Claims are formulated to overcome any further objections.

Applicant again attaches documentation by ETV Environmental Technology Verification Canada, and CGRI Canadian Gas Research Institute, under the required Affidavit as well as a Declaration in accordance with 37 CFR 1.132. Such documents verify that the Invention disclosed in the present Application is contrary to any expectation by anyone known in the art, even by someone extremely well versed in the art, and that the information confirmed in such documents may well traverse any of the objections posed by the Examiner.

Applicant believes to have herewith properly responded to the Notice of Non-Compliant Amendment, and by attaching a complete listing of all Claims, including a set of amended Claims, and that accordingly, Applicant's response filed January 6, 2006 is therefore now in compliance.

Applicant therefore respectfully requests the Examiner to move this Application to allowance. Should any minor adjustments or amendments be required, Applicant will, under Examiner's guidance, provide any such reasonably required adjustment forthwith.

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Signed this July 1, 2006,

William H. Velke  
Applicant

Attachment:

Claims Amendment	Pending Claims
CGRI Document	
ETV Report	